The Millennium Science Initiative

Promoting Science and Technology Capacity for Development

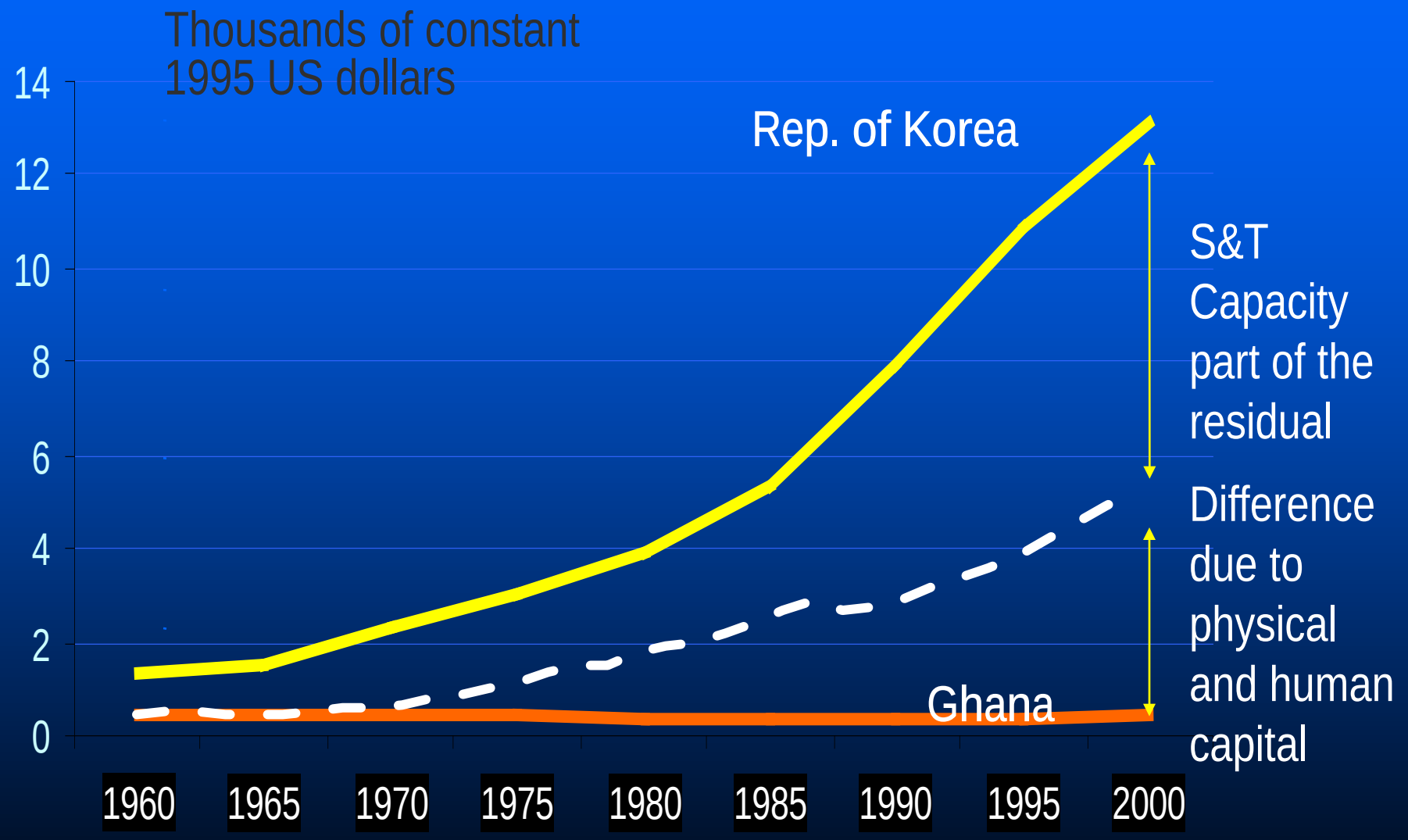
Michael Crawford

May 14, 2004

Structure of Presentation

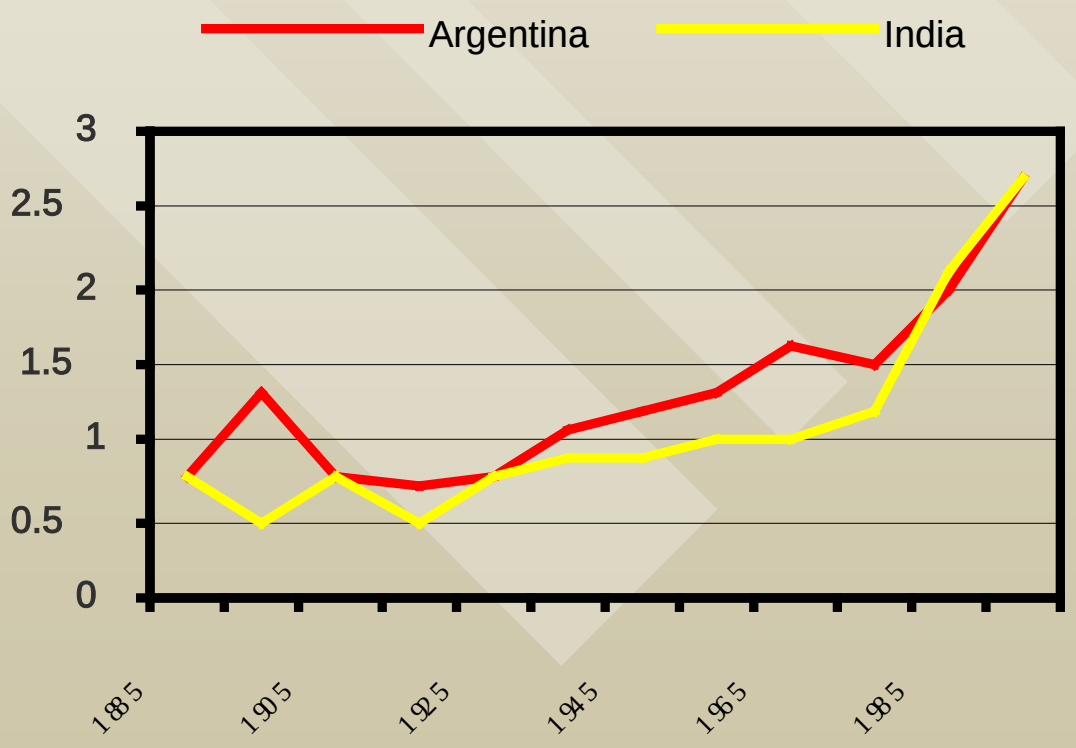
- Science in Economic Development
- The Knowledge and Technology Divide
- Previous World Bank Experience with Support to Science and Technology
- The Goals and Characteristics of the Millennium Science Initiative
- The Achievements of the MSI in Chile
- Uganda: The MSI in an IDA Context
- Working with Partners for S&T Capacity Building

Differences in Physical and Human Capital do not Explain all of Growth…



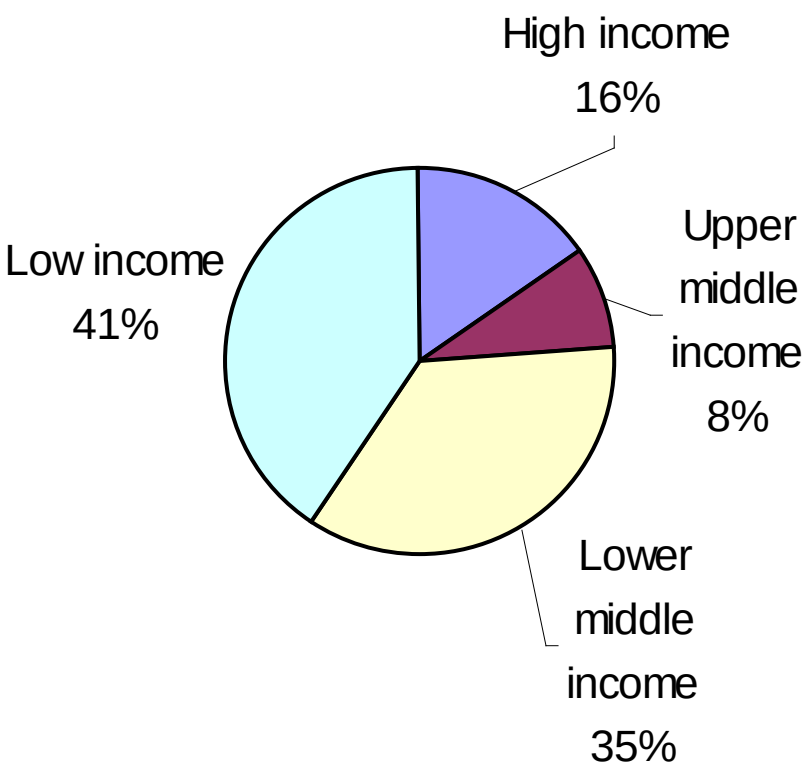
Global Agricultural Yields Increase Due to Science Power

Average annual yields in 1,000 Kilogram/ Hectare

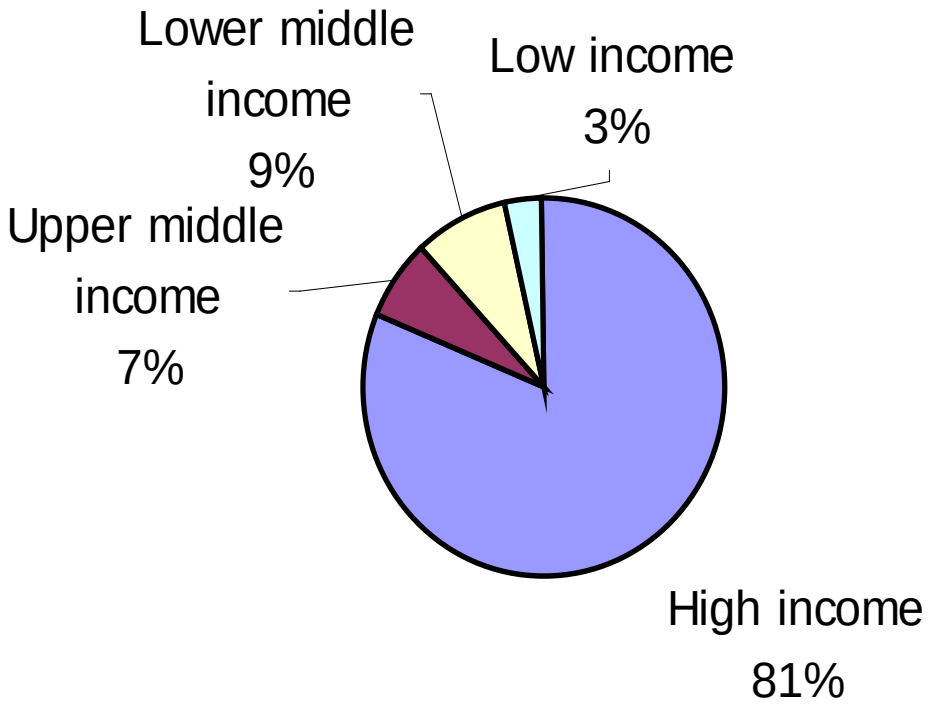


Global Distribution of Population & GDP

2001 (Population)

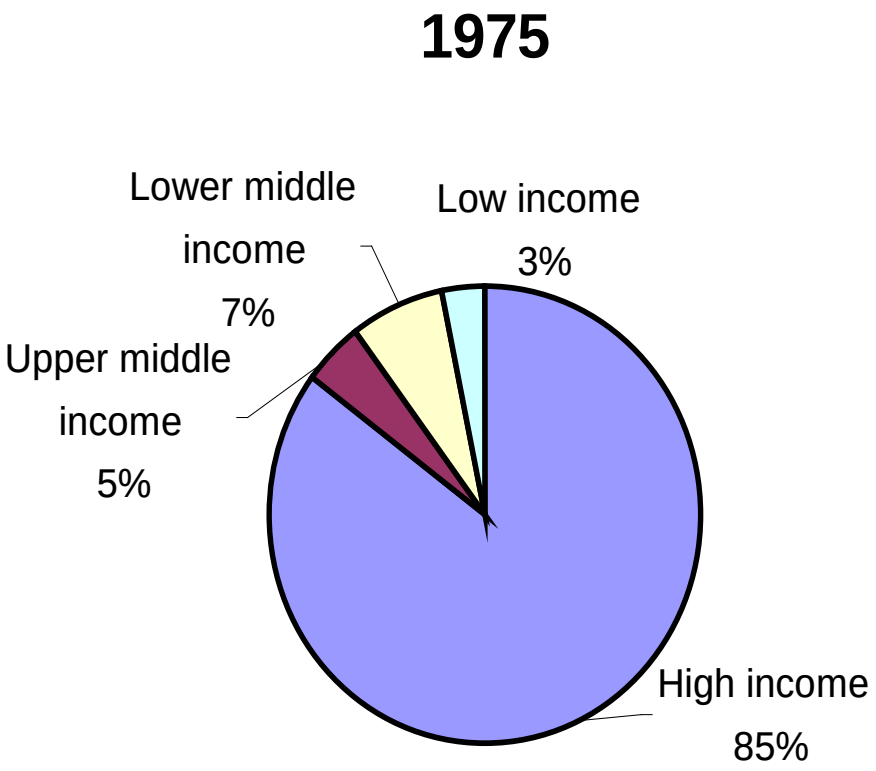


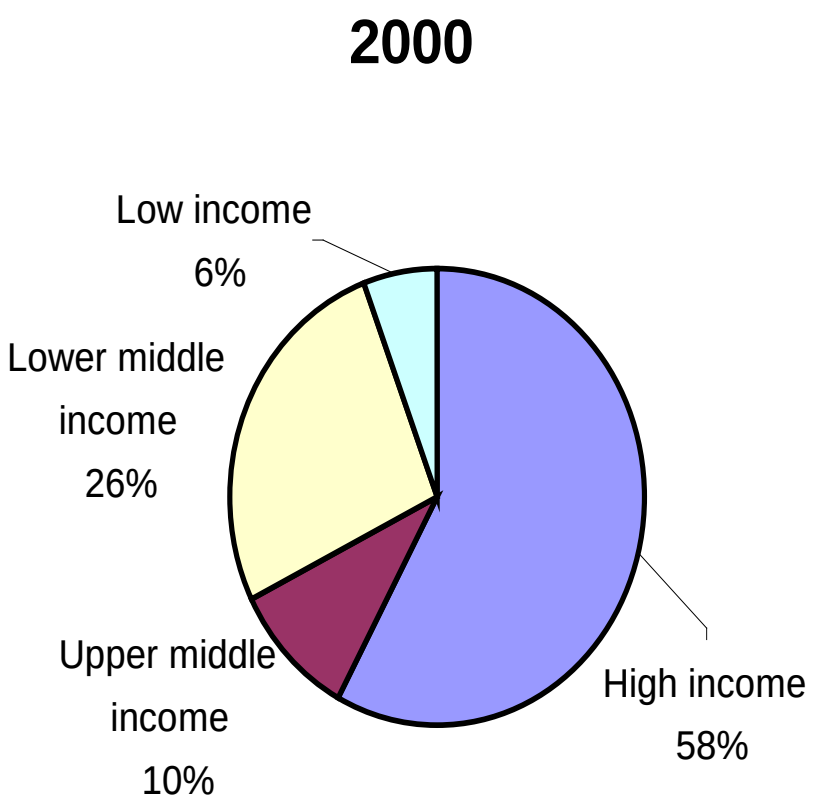
2001(GDP)



Source: World Bank SIMA database.

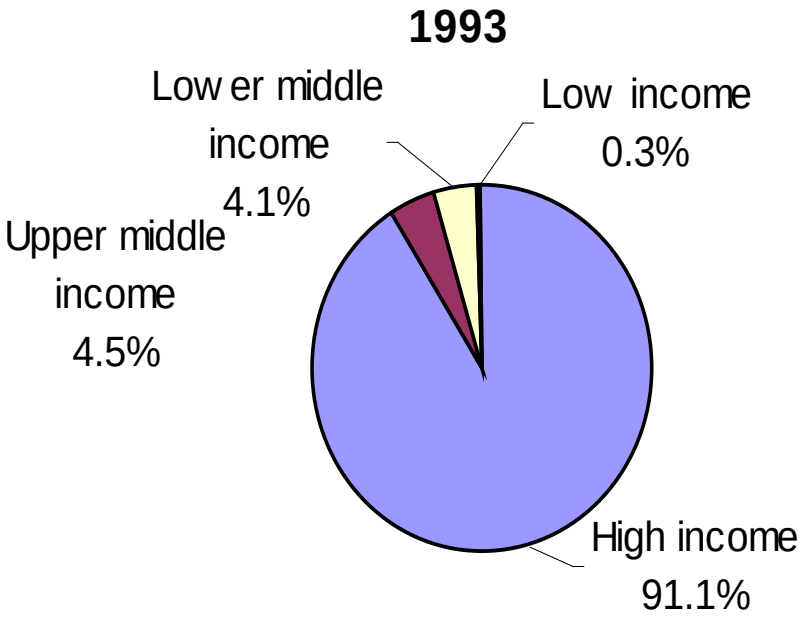
Global Distribution of Telephone Mainlines

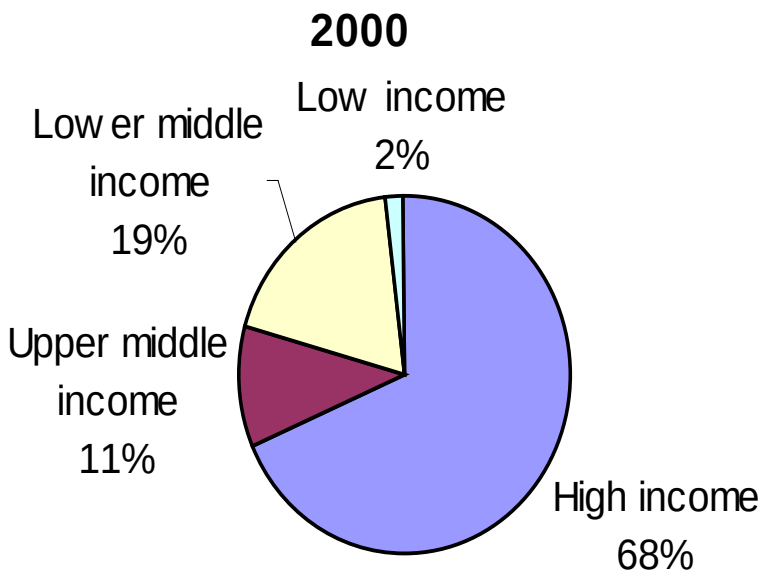




Source: Calculated based on World Bank SIMA database.

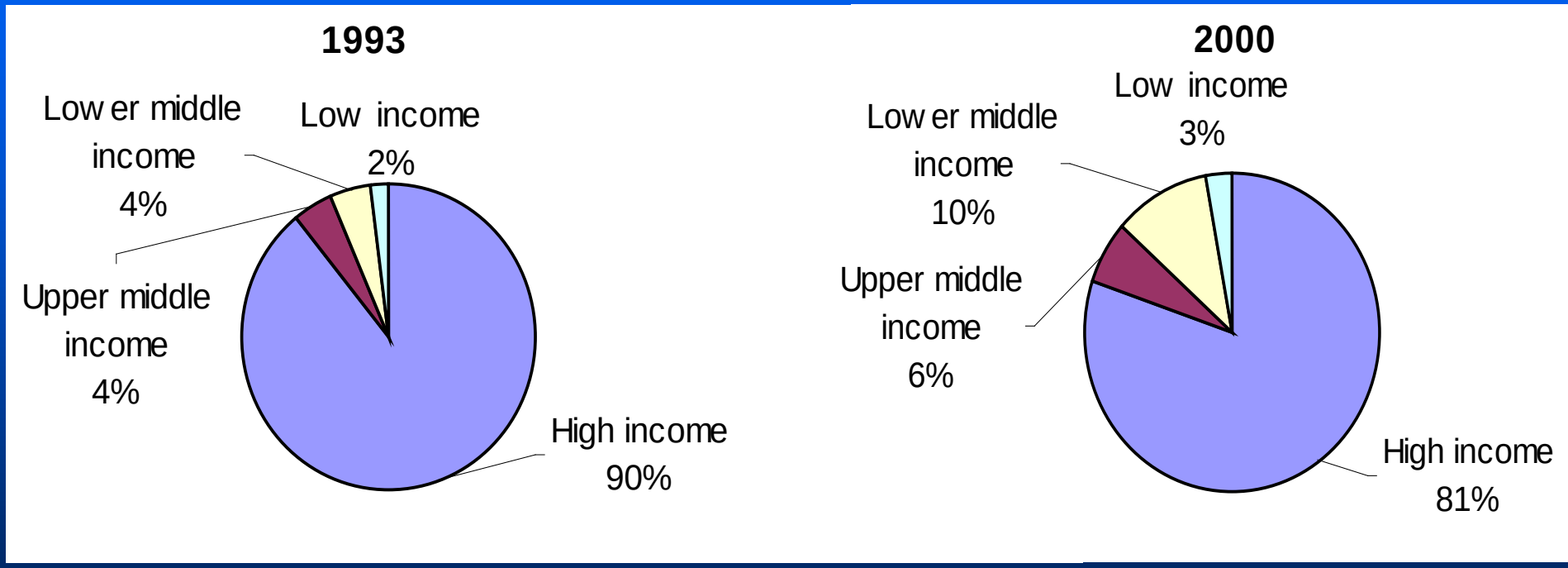
Global Distribution of Mobile Phones





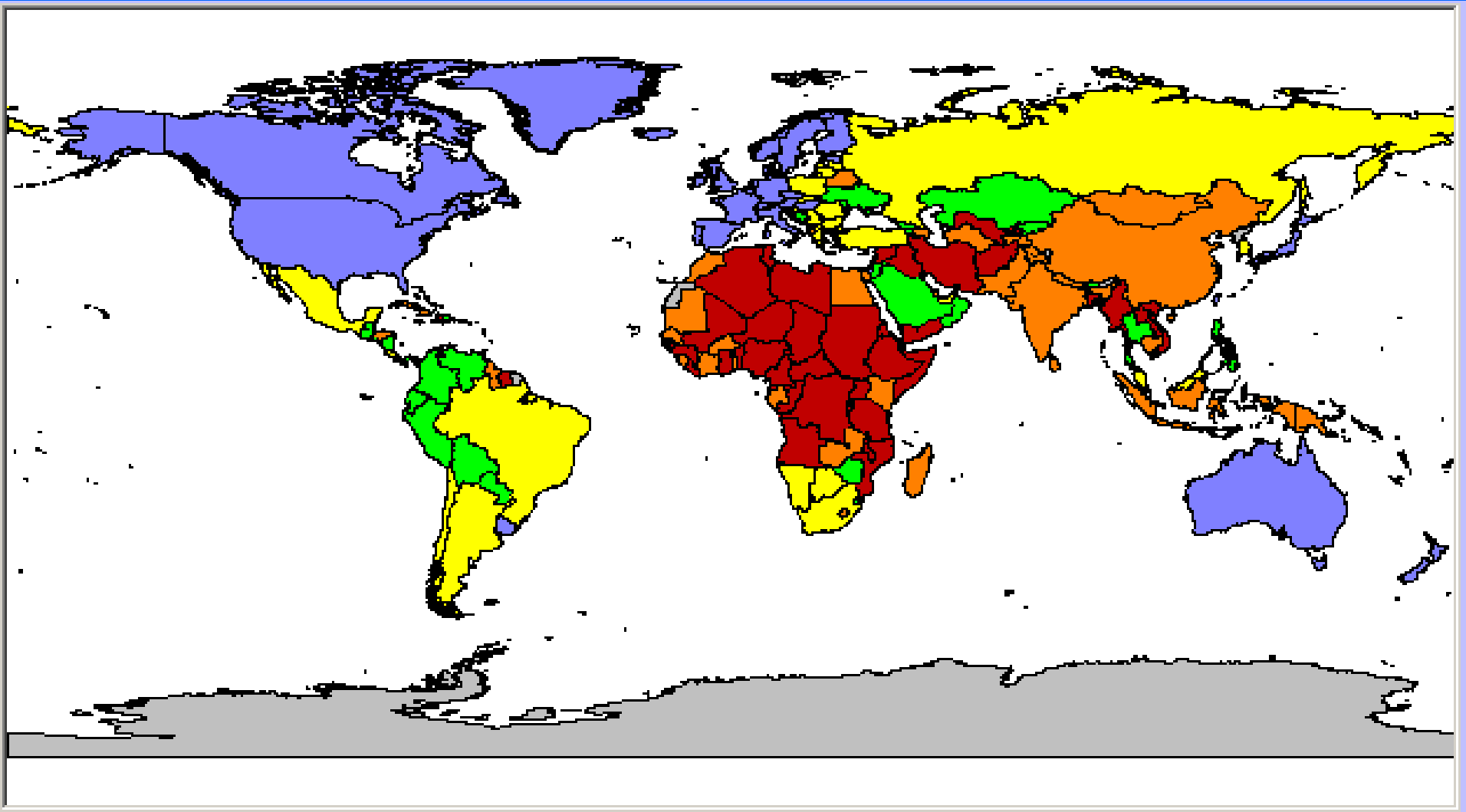
Source: Calculated based on World Bank SIMA database.

Global Distribution of Personal Computers



Source: Calculated based on World Bank SIMA database.

Internet Hosts (per 10,000 people, 2000)



Internet hosts (per 10,000 people)

less than	.2
.2	1.2
1.2	10.2
10.2	100.7
100.7	or more
No data available	

Cities

Lakes

Rivers

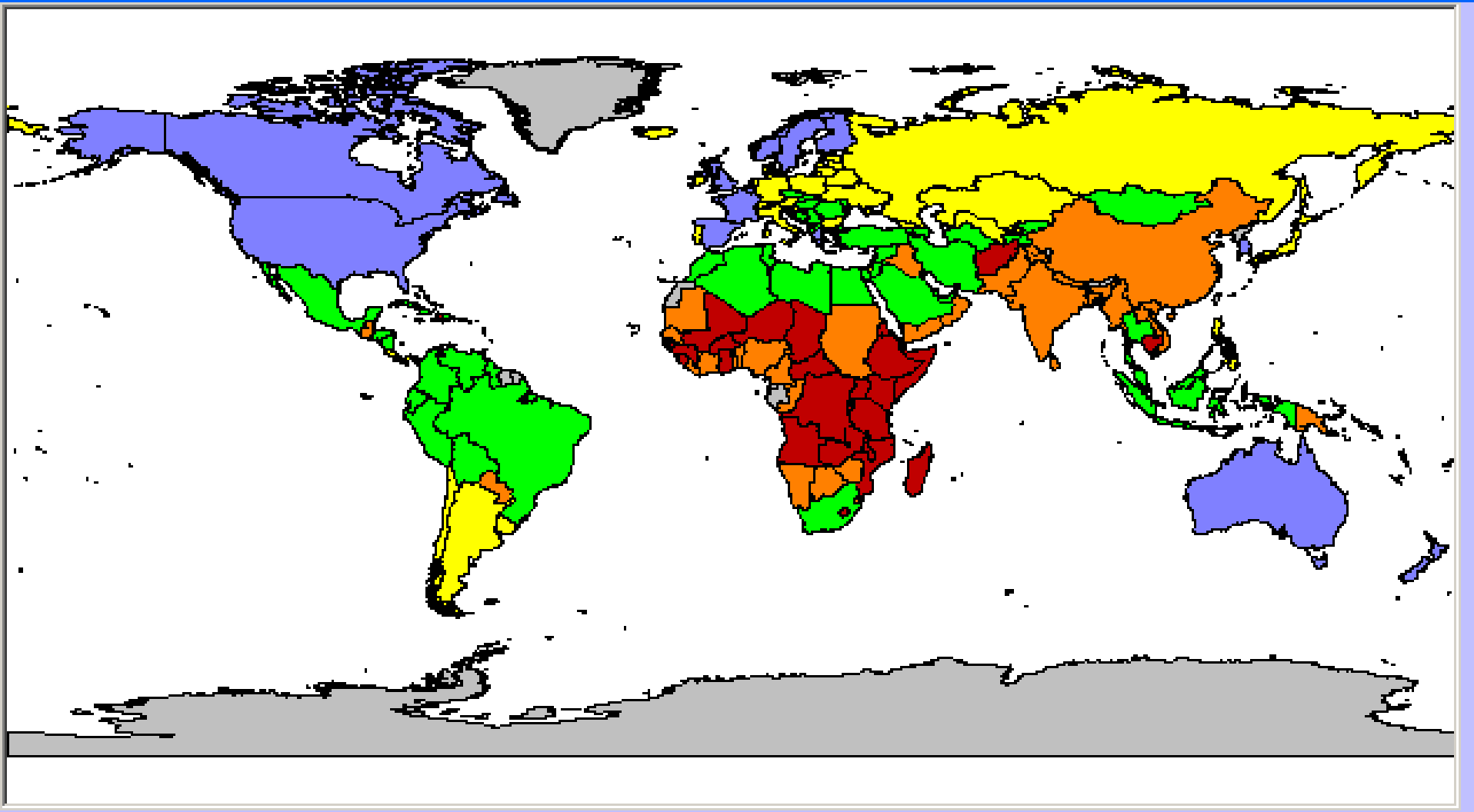
Units

2000

Recalculate

Remap

Higher Education Enrollment Ratio (1997)



School enrollment, tertiary (% gross)

	less than	2.7
	2.7	10.9
	10.9	28.7
	28.7	50.3
	50.3	or more
	No data available	

Cities

Units

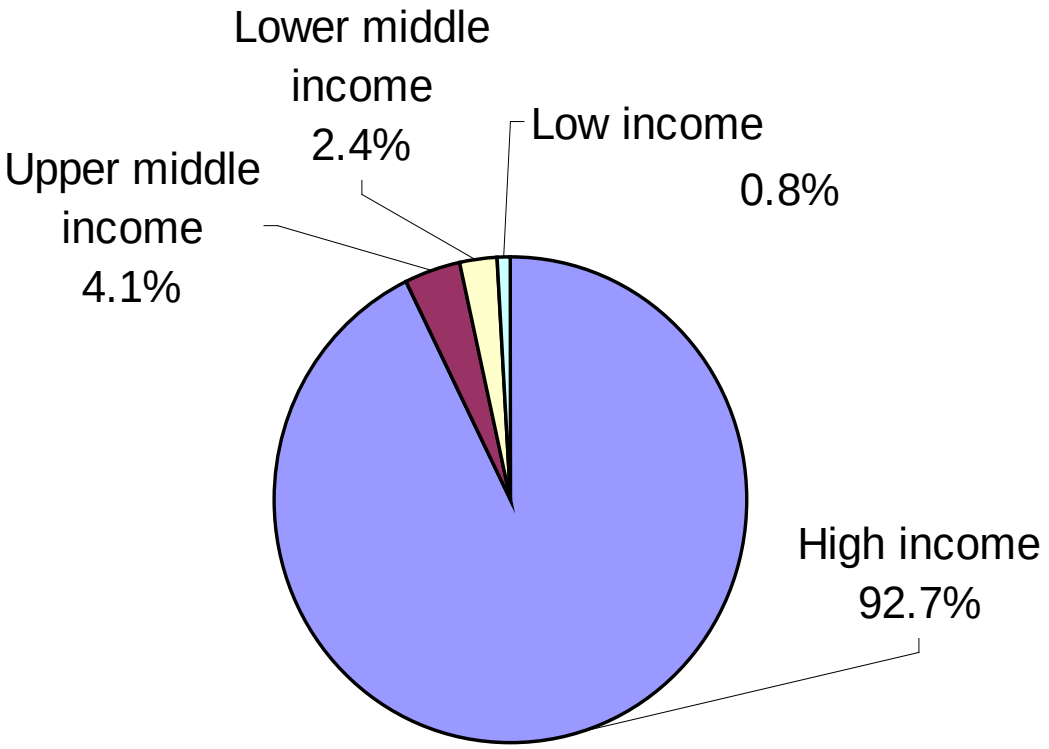
1997

Rivers

Recalculate

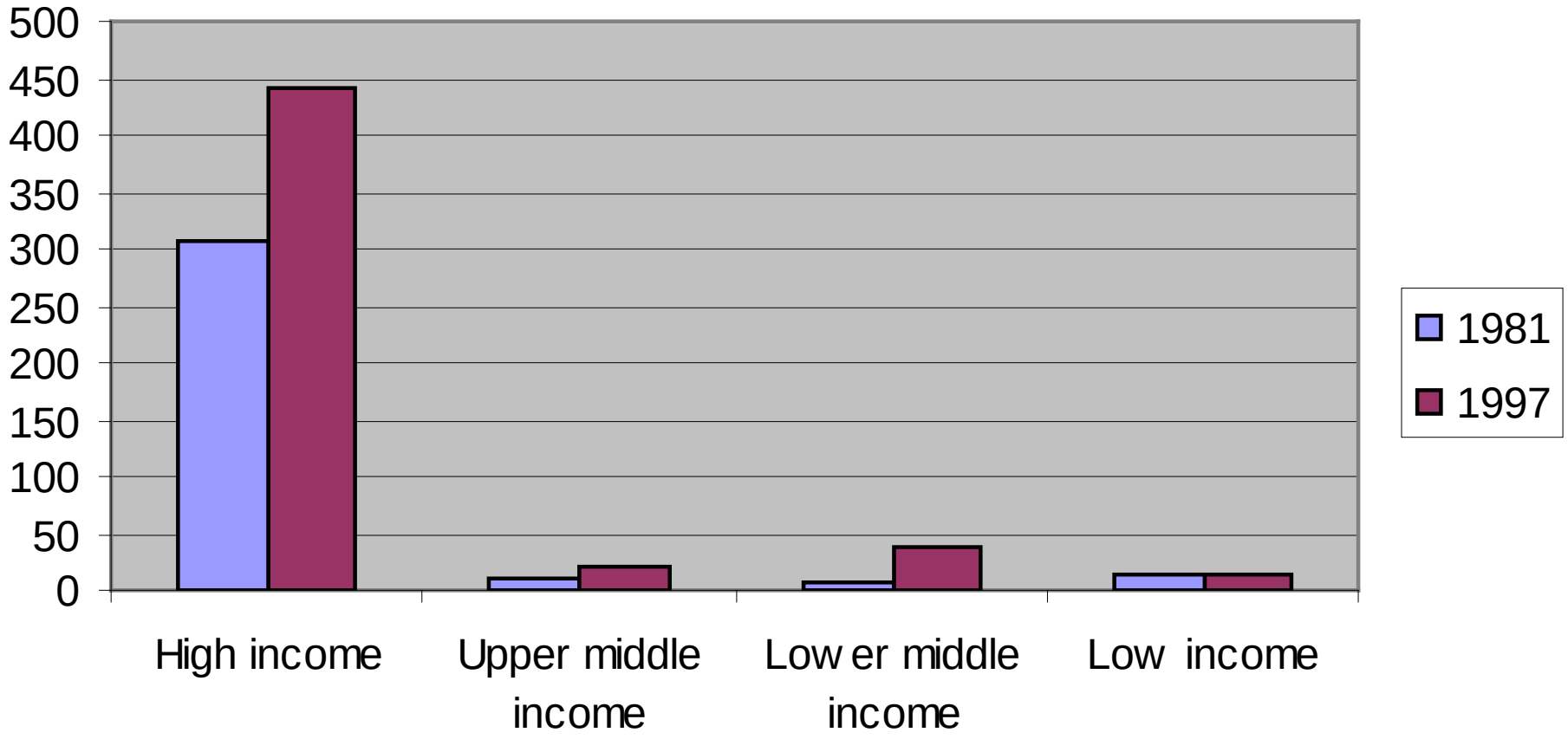
Remap

Global Distribution of R&D expenditures (1997)



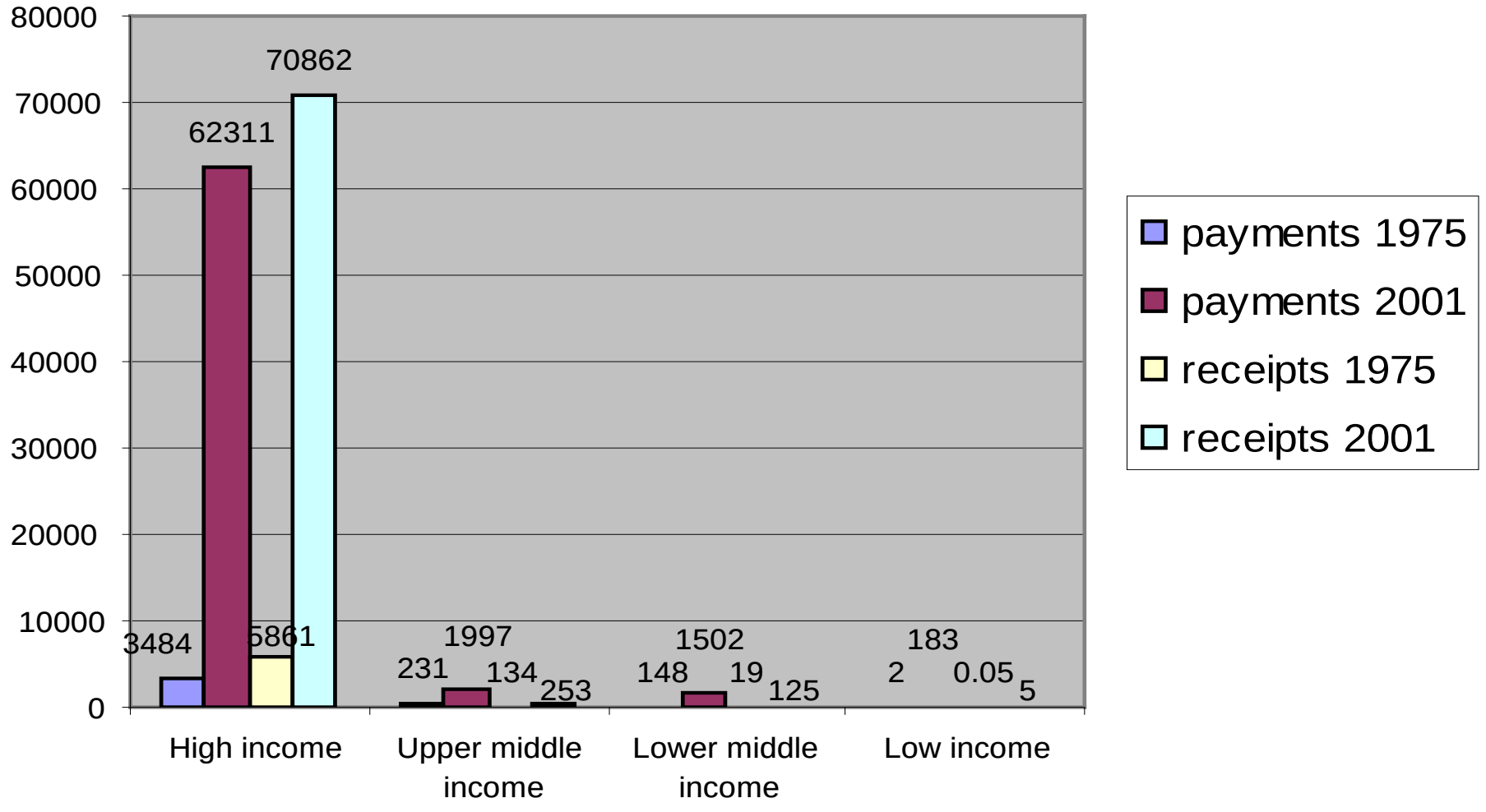
Source: calculated based on data from the World Bank SIMA database 2002

Scientific & Technological Journal Articles (x1000)



Source: World Bank SIMA database.

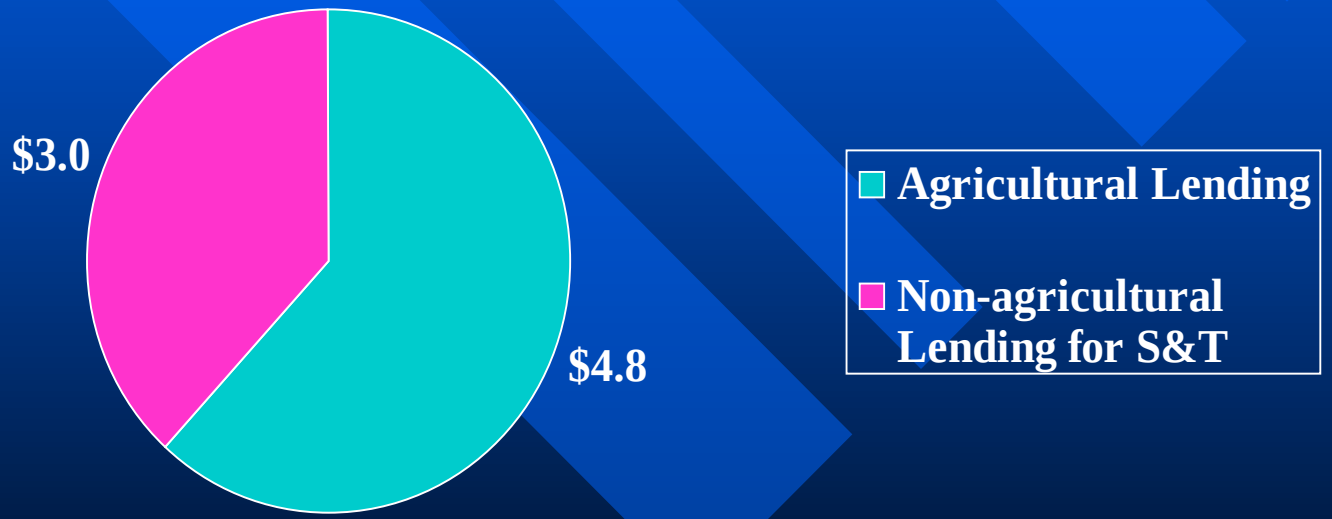
Royalty and license fees, payments & receipts (BoP, current US$, Millions)



Source: World Bank SIMA database.

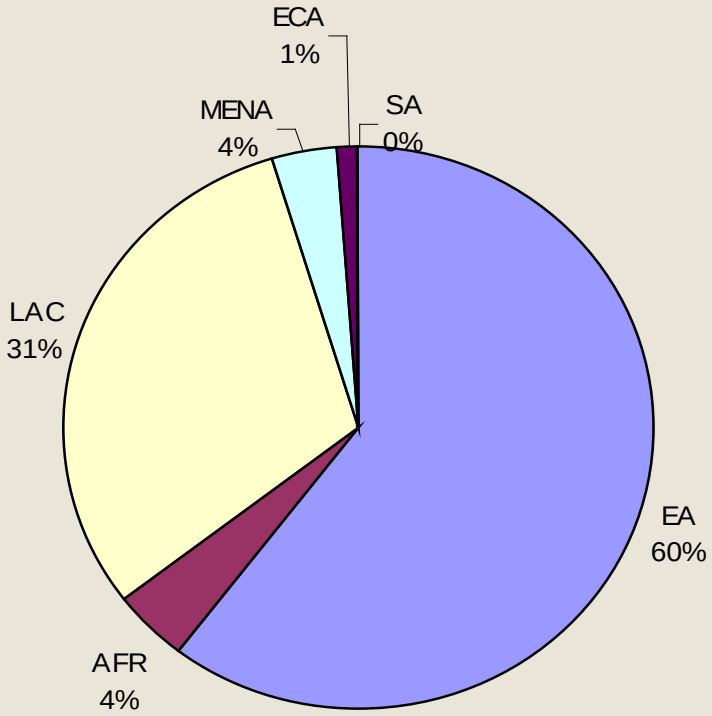
Agriculture Accounts for More than Half of World Bank S&T Lending

$4.8 Billion in 447 projects or components for S&T in Agriculture, 1980-99



Outside of Agriculture, Most S&T Lending Has Gone to East Asia and LAC

Lending Volume by Region, 1992-1998



1997: The Idea for the MSI

- Develop S&T Capacity through support of international-level quality research;
- Increase Ph.D, Master's, Post-doc training opportunities;
- Create alternatives to brain drain, incentives for brain gain
- Involve researchers in "social marketing" of science in secondary schools;
- Consolidate transparent, peer reviewed resource allocation for research funding;;
- Valorize research relevance;
- Create linkages to the private sector;

Competitive Grants: A Basic Feature of the MSI

- Fluctuation and Fragmentation of Research Resources a Perennial Problem in Middle Income Countries;
- The MSI in Chile Funded 3 “Institutes” at US$ 1 million per year for 5 years;
- 10 MSI “Nuclei” were funded at US$ 300,000 per year for 3 years. Nuclei grants are renewable.
- Grant Selection Committee composed of top rank Chilean and International scientists;
- Initial project in Chile sparked regional interest in the MSI

LAC Region is an Early Adopter

- 1998: Chile MSI Project Approved (2.5 year, $15m project/$5 million loan)
- 1999: Venezuela MSI Project Approved (2.5 year, $15m project/$5 million loan)
- 2000 Mexico adds MSI Component to an Existing S&T Infrastructure Loan;
- 2000 Brazil provides grants for 17 MSI Institutes with WB Support

Chile: Achievements of the MSI

- MSI Closed in 2002:
- Given highest ICR ratings in all categories:
- Government increased attention to S&T and Innovation Policy as a result of the Project;
- A larger, follow on program for Support to S&T Capacity approved;
- S&T Institutions strengthened, international linkages improved

Chile MSI: Impact on the S&T System

- Prior to the MSI, Chile produced 50 Ph.Ds per year domestically;
- New advanced training opportunities: 28 Ph.D positions, 5 post-docs, and 6 new M.Sc.; 6 foreign graduate students supported;
- Research productivity increased (publications and patents);
- International collaborations up by 50%;
- Monitoring, evaluation, and accountability increased;
- Higher confidence in transparent, merit-based selection processes reported

Uganda: The MSI in an IDA Context

- IDA Country with annual GDP per capita of US $300;
- 5% have access to electricity;
- Agriculture is 40% of GDP, employs over 70% of the labor force;
- Poor health and disease are the top reported cause of poverty;

Uganda: Progress in Key Related Areas

- A decade of macro-economic stability
- HIV incidence down to 6% from high of 15%
- Overall policy coherence high
- Commitment to reform of higher education over the past three years
- Decentralization creating need for technical skills for service delivery outside central government

The MSI Process in Uganda: Focus on Sector-wide Coherence

- Pre-university science education
- Promotion of research in new universities, outside of the capital
- Coherence with health, agriculture, environment policies
- Building on the gains at Makerere
- Not only research focused: engineering and strengthening undergraduate departments key
- NETF providing critical support for a participatory diagnosis of the state of the sector

Expanding the MSI

- In Africa: Cameroon, Tanzania talks
- South Asia: Bangladesh
- Eastern Europe/Central Asia: Kazakhstan, Russia, and Latvia
- Joining forces with capacity building efforts from the Inter-Academy Council

Thank You

Additional information available in

The Millennium Science Initiative Status Report